

# Comparison between Dependent Multiple Samples and Independent Multiple Samples in Sample Management - QM



## Applies to:

SAP QM Consultants, SAP ECC 6.0. For more information, visit the Supply Chain Management homepage.

For more information, visit the [Supply Chain Management homepage](#).

## Summary

When the user wants to use the Sampling Procedure, he can adopt the (a) Dependent Multiple Sample Procedure and (b) Independent Multiple Sample Procedure.

For Normal Inspection, Independent Multiple Sample Procedure can be used.

For tight Inspection, Dependent Multiple Sample Procedure is used.

For Stringent quality norms, Dependent Multiple Sample is preferred.

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## Author Bio



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## 1. Basic concepts and Master Data

### 1.1 Acceptance Number → Denoted by c

For an attributive inspection, the highest number of nonconforming units or the highest number of defects in a sample that leads to an acceptance of the inspection lot.

c → Acceptance Level.

### 1.2 Rejection Number → Denoted by d

For an attributive inspection, the lowest number of nonconforming units and/or the lowest number of defects in a sample that result in a rejection.

D → Rejection Level.

Number of Non Conformity allowed in sample Number 1 → c1

Number of Non conformity for rejection criteria in Sample Number 1 → d1

### 1.3 Dependent Multiple Sample Scenario

System permits to create maximum of 7 samples for one Inspection Lot.

Samples may vary from two to seven, as per the requirement of business Process.

The recorded NCs must be in between c and d values.

→ Then only the system allows creating a new sample.

→ The NC of each sample is cumulated for validation.

The user wants to create multiple samples one by one manually in Result Recording Screen, when the Non Conformity (NC) of the samples is in between allowable level and rejection level.

(Between c and d)

Each sample is interdependent and non conformities are cumulated till 7th Sample/ Maximum Allowable Samples as per Sampling Scheme.

When each time a sample is completed, system adds the sample size as well as NC of completed samples. Once the sample is rejected, the new sample can not be created.

Total cumulated NCs of all the seven samples are less than the rejection level, the Inspection Lot is accepted.

Total cumulated NCs of all the seven samples are equal or more than the rejection level, the Inspection Lot is rejected.

The rejection level is indicated by → d1 to d7.

Ex: Dependent multiple sample procedure is used in Lamp Industries, for specific customer where stringent quality measures are to be adhered

In Lamp Industry, every hour 1500 to 2600 incandescent lamps are manufactured.

Similar industries, where huge quantity is produced, the dependent multiple sample procedures can be used. Once the lot is rejected, 100 % inspection is carried out to eliminate the non conformities

System allows a Maximum of seven samples for any Inspection Lot.

→ c1, c2, c3, c4, c5, c6 and c7 are acceptable level of seven samples.

→ d1, d2, d3, d4, d5, d6 and d7 are rejection level of seven samples.

#### 1.4 Independent Multiple Sample Scenario

System permits to create any number of samples for one Inspection Lot.

Samples may vary from one to any number, as per the requirement of business Process.

The recorded NCs must be equal to d or more than d values.

→ Then only the system allows creating a new sample.

→ The NC of each sample is independent and there is no link between any two samples.

The user wants to create multiple samples one by one manually in Result Recording Screen, when the Non Conformity (NC) of the samples is equal to d or more than d.

**System validates the sample as rejected.**

**The new sample can be created only after the sample is rejected.**

System allows exactly only one Sample Size for any Inspection Lot.

→ C1 only exists → Acceptance Level.

→ D1 only exists → Rejection Level.

**Sampling Scheme contains only one Sample → c1, d1 only exists.**

## 1.5. Define the Sampling Scheme.

### 1.5.1 Sampling Scheme for Dependent Multiple Sample

Sampling Scheme is system defined / user defined table.

This table defines the sample size for various inspection lot quantities.

For the combination of Inspection Lot quantity and Sample size, c1,d1;c2,d2;c3,d3;c4,d4;c5,d5;c6,d6; and c7,d7 are defined.

#### Quality Management → Basic Data → Sample → Sampling Scheme → QDP1 - Create.

Sampling scheme → DEP → “Samp.Scheme for Dependent Multiple Sample” is created.

Existing sampling procedure is copied and c values and d values are modified as per requirement.

Most Important point to be noted.

For example → For inspection Lot Qty say 130 which falls in between 91 and 150, the sample size is 8.

AS per table, seven samples can be taken.

Hence Sample Qty., → Sample Size per Sample and No. of Samples.

$$\rightarrow 8 \times 7 = 56.$$

**Change Sampling Scheme: Sampling Table**

Administrative data

Sampling scheme: DEP | Samp.Sche. for Dependent Multiple Sample

Assignment parameters for the sampling table

Inspection severity: 4 | Normal inspection

AQL value: 15.000

Sampling Plans

Lot size	Sample si	c1	d1	c2	d2	c3	d3	c4	d4	c5	d5	c6	d6	c7	d7
25	5	1	3	2	5	3	7	4	12	6	14	8	15	9	17
50	6	1	3	2	5	4	8	5	13	6	14	8	15	9	17
90	7	1	4	2	5	5	9	6	14	7	15	8	16	9	17
150	8	1	4	2	5	6	10	7	15	8	16	9	19	10	23
280	13	1	4	2	5	6	8	7	9	8	10	9	11	10	13
500	15	1	4	2	5	7	11	8	13	9	17	10	18	11	22
1300	20	1	5	2	6	6	8	8	10	10	13	11	17	12	22
1700	26	1	9	2	13	4	15	6	17	8	18	11	21	13	26
10000000000	31	1	9	2	13	4	15	6	17	8	18	11	21	13	26

After Goods Receipt, the System creates the Inspection Lot Say → 3740 automatically.

Inspection Lot qty. is 130 and Sample size is 56.

As per the Sampling Scheme – DEP, the above values are correct.

Plant	1000	Werk Hamburg	
Inspection Lot	3740		
Material	QS8X20	Hexagon head screw ISO4017 M8x20-8.8-A1C	
Insp. lot origin	01 Goods Receipt		
Inspection type	01	Goods Receipt Inspection for Order	
System Status	REL CALC SPRQ	UserStatus	

Quantities		PC	
Insp. lot qty	130	PC	
Actual lot qty	130		
Sample size	56	PC	
Postings	130		

<input checked="" type="checkbox"/> Insp. stock	<input type="checkbox"/> GR blocked stck
Destroyed qty	0
Defective qty	0

### 1.5.2 Sampling Scheme for Independent Multiple Sample

Sampling Scheme is system defined / user defined table.

This table defines the sample size for various inspection lot quantities.

For the combination of Inspection Lot quantity and Sample size, c1,d1; are defined.

### Quality Management → Basic Data → Sample → Sampling Scheme → QDP1 - Create.

Sampling scheme → IND → “Samp.Scheme for Indepen.Mul.Sample” is created.

Existing sampling procedure is copied and c values and d values are modified as per requirement.

Most Important point to be noted.

For example → For inspection Lot Qty say 130 which falls in between 91 and 130, the sample size is 8.

AS per table, Exactly only one samples can be taken.

Hence Sample Qty. → Sample Size per Sample and No. of Samples.

→ 8 X 1 → 8 No.

System exactly creates only one sample of Sample Size 8 for the Inspection Lot Qty. → 130.

Sampling scheme Edit Goto Extras System Help

**Change Sampling Scheme: Sampling Table**

Administrative data

Sampling scheme: IND | Samp.Scheme for Indepen.Mul.Sample

Assignment parameters for the sampling table

Inspection severity: 4 | Normal inspection

AQL value: 15.000

Sampling Plans

Lot size	Sample si	c1	d1	c2	d2	c3	d3	c4	d4	c5	d5	c6	d6	c7	d7
25	3	1	3												
50	4	1	3												
90	4	1	3												
130	8	1	4												
280	13	1	8												
800	17	1	13												
1000	22	1	17												
1300	26	1	22												

After Goods Receipt, the System creates the Inspection Lot Say → 3742 automatically.

Inspection Lot qty. is 130 and Sample size is 8.

As per the Sampling Scheme – IND, the above values are correct.

**Change Inspection Lot: Sample**

Inspection instruction | Sample drawing instruction | Status history | Correct actual quantity | Material

Plant: 1000 | Werk Hamburg

Inspection Lot: 3742

Material: QS8X20 | Hexagon head screw ISO4017 M8x20-8.8-A1C

Insp.lot origin: 01 Goods Receipt

Inspection type: 01 | Goods Receipt Inspection for Order

System Status: REL | CALC | SPRQ | UserStatus

Origin | Insp. specifications | **Sample**

Quantities

Insp.lot qty	130	PC	No. Containers	0.000
Actual lot qty	130		<input checked="" type="checkbox"/> Inspection stock	
Sample size	8	PC	<input type="checkbox"/> GR blocked stock	

## 1.6. Create Sampling Procedure and Assign the Corresponding Sampling Scheme

### 1.6.1 Dep. Multiple Sample-Create Sampling Procedure-“MULSAMPL”&assign Sampling Scheme “DEP”

Quality Management → Basic Data → Sample → Sampling Procedure → QDV1 – Create

Sampling procedure  Samp.Pro.For Dependent Multiple Sampling

**Assignments**

Sampling type	<input type="text" value="300 Use sampling scheme"/>
Valuation mode	<input type="text" value="100 Attributive inspection nonconf. units"/>
Sampling scheme	<input type="text" value="DEP"/> Samp.Sche. for Dependent Multiple Sample
Determination rule	<input type="text" value="30"/> Use sampling scheme

**Special indicator**

No stage change

**Multiple samples**

No multiple samples  
 Indep. multiple smps  
 Dep. multiple Sampls

Valuation rule  Dependent multiple samples



1.6.2 Ind. Multiple Sample - Create Sampling Procedure–“INDEPEND” and assign Sampling Scheme – “IND”

Quality Management → Basic Data → Sample → Sampling Procedure → QDV1 – Create

Sampling procedure Edit Goto Extras Environment System Help

Change Sampling Procedure: Special Conditions

Additional data & Sampling scheme & Administrative data

Sampling procedure  INDEPENDENT SAMPLING WITH INS.SEVERITY

Assignments

Sampling type	<input type="text" value="300 Use sampling scheme"/>
Valuation mode	<input type="text" value="100 Attributive inspection nonconf. units"/>
Sampling scheme	<input type="text" value="IND"/> Samp.Scheme for Indepen.Mul.Sample
Determination rule	<input type="text" value="30"/> Use sampling scheme

Special indicator

No stage change

Multiple samples

No multiple samples

Indep. multiple smps

Dep. multiple Sampls

Valuation rule  Additional samples: Best case principle

Start | DEPENDENT M... | DEPENDENT M... | Document2 - Mi... | 3 SAP

### 1.7. Create Inspection Plan for the Material → QS8X20

**Change Inspection Plan: Header Details**

Group 241      Dependent Multiple Sample      Grp.Count1

Material Assignment

Group: 241      Key date: 10/23/2009      Change No.:

G...	Description	Material	Plnt	Description	Vendor	Name
1	Dependent Multiple Sample	QS8X20	1000	Hexagon head screw ISO40	1234	KONE ELEV/
1	Dependent Multiple Sample	QS8X60	1000	Hexagon head screw ISO40	1234	KONE ELEV/

### 1.8. Assign the MIC to the Operation

**Change Inspection Plan: Characteristic Overview**

Group 241      Dependent Multiple Sample      Grp.Count1

Activity: 0010      Dependent Multiple Sample

Quan. Data      Catalogs

Inspection characteristics

Char.	Preset in...	Qn	QI	Master ins...	Plant	Version	R...	Short text insp.char
10		<input checked="" type="checkbox"/>	<input type="checkbox"/>	MULTIPLE	1000	1	∞	MULTIPLE
20		<input type="checkbox"/>	<input type="checkbox"/>		1000			

### 1.9. Assign the Sampling Procedure to the MIC

1.9.1 Whenever Dependent Multiple Samples is Required, Assign → Sampling Procedure → MULSAMPL

**Change Inspection Plan: Dynamic Modification**

Master insp. charac.      Control indicators

Group 241      Dependent Multiple Sample      Grp.Count1

Activity: 0010      Dependent Multiple Sample

Characteristic: 10      MULTIPLE

Quantitative char. (lower/upper tolerance), Single results, Required char., Fixed scope

General data      Quantitative data      **Sample**

Sample	
Sampling procedure	MULSAMPL      INDEPENDENT SAMPLING WITH INS.SEVERITY
Multiple samples	X      Independent multiple samples
Sample unit of meas.	PC
Base sample quantity	1.00

1.9.2 Whenever Independent Multiple Samples is Required, Assign →Sampling Procedure →INDEPEND

The screenshot shows the SAP 'Change Inspection Plan: Dynamic Modification' dialog box. The 'Sample' tab is selected, and the following data is visible:

Field	Value	Description
Group	241	Grp.Count1
Activity	0010	Dependent Multiple Sample
Characteristic	10	MULTIPLE
Quantitative char. (lower/upper tolerance), Single results, Required char., Fixed scope		
<b>Sample</b>		
Sampling procedure	INDEPEND	Samp.Pro.For Dependent Multiple Sampling
Multiple samples	1	Dependent multiple samples
Sample unit of meas.	PC	
Base sample quantity	1.00	

## 2. Table for Comparison

S.No.	Requirement	Dependent Multiple Sample	Independent Multiple Sample
1	Inspection	Tightened	Normal
2	No. of Samples in Sampling Scheme	Maximum - 7	Exactly one. C1, d1 only exists in Sampling Scheme.
3	NC --> Defects --> Cumulated	TRUE	FALSE
4	NC --> Defects Dependency	Link exists for all samples tested	No Link between samples tested
5	To create a new Sample, NC --> Defects between c and d	TRUE	FALSE
6	To create a new Sample, NC --> Defects equal to d or more than d --> ie Inspection Lot is rejected.	FALSE	TRUE
7	Sampling Scheme are created uniquely for Dependent Multiple Sample and Independent Multiple Sample	TRUE. For Ex. Sampling Scheme --> DEP is created	TRUE.  For Ex. Sampling Scheme --> IND is created
8	System assigns the Valuation Rule automatically	System assigns the Valuation rule 66 for Dependent multiple samples	System suggests the Valuation rule 60,61&62 for Independent multiple samples

## **Related Content**

[SAP help on QM](#)

[SAP help on Inspection Lot Completion](#)

For more information, visit the [Supply Chain Management homepage](#).

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